



# Welcome!

Please come in and have a look at the final recommendations for the **Glenmore Trail East Study**. The project team is available to answer your questions.

Comment forms are available here, as well as online at [calgary.ca/GlenmoreTrailStudy](https://calgary.ca/GlenmoreTrailStudy) until May 4, 2018.

All comments received will be attached to the final report, which will be presented to Calgary City Council this summer.

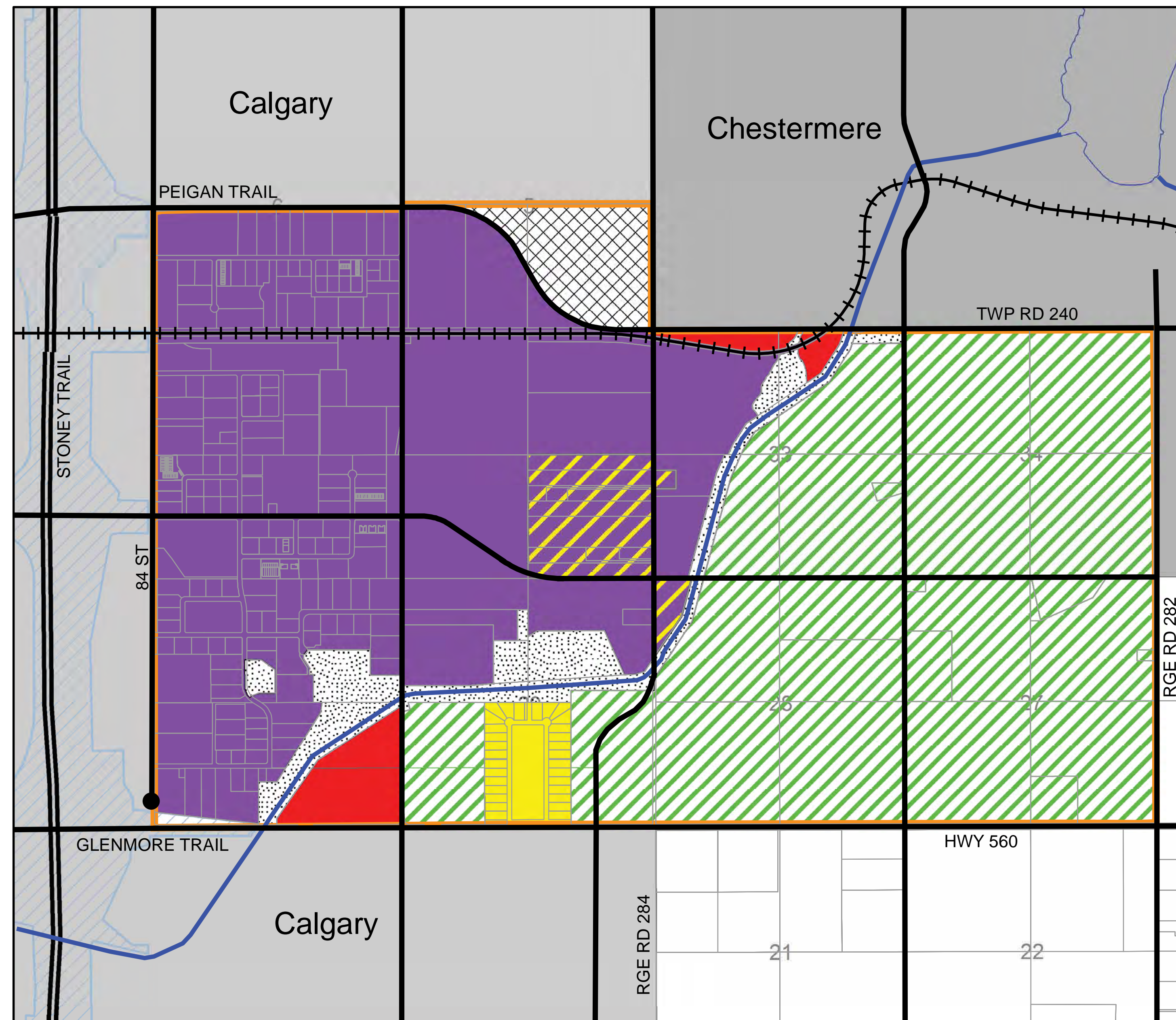
**Thank you for coming!**

# Study area and partners

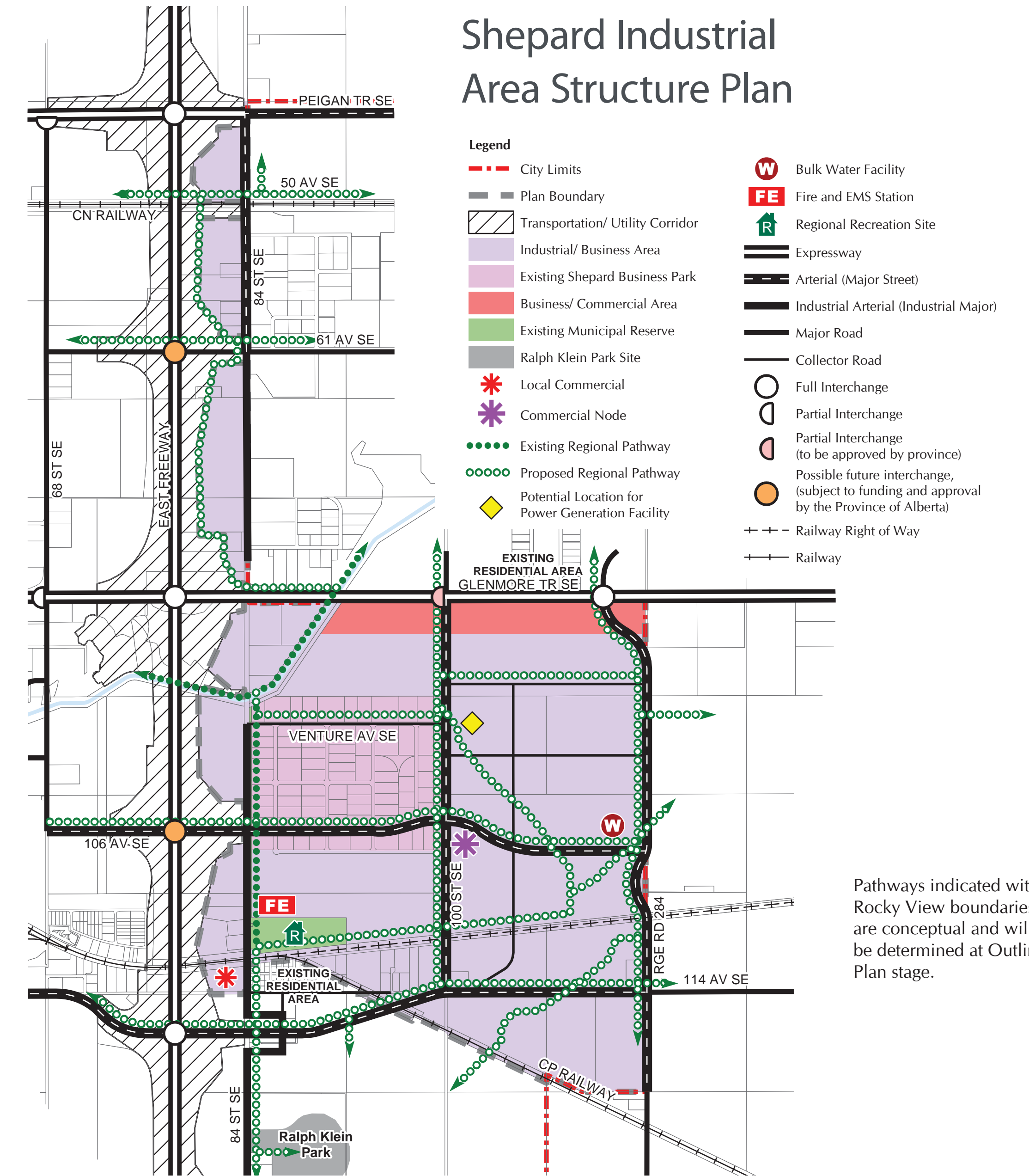
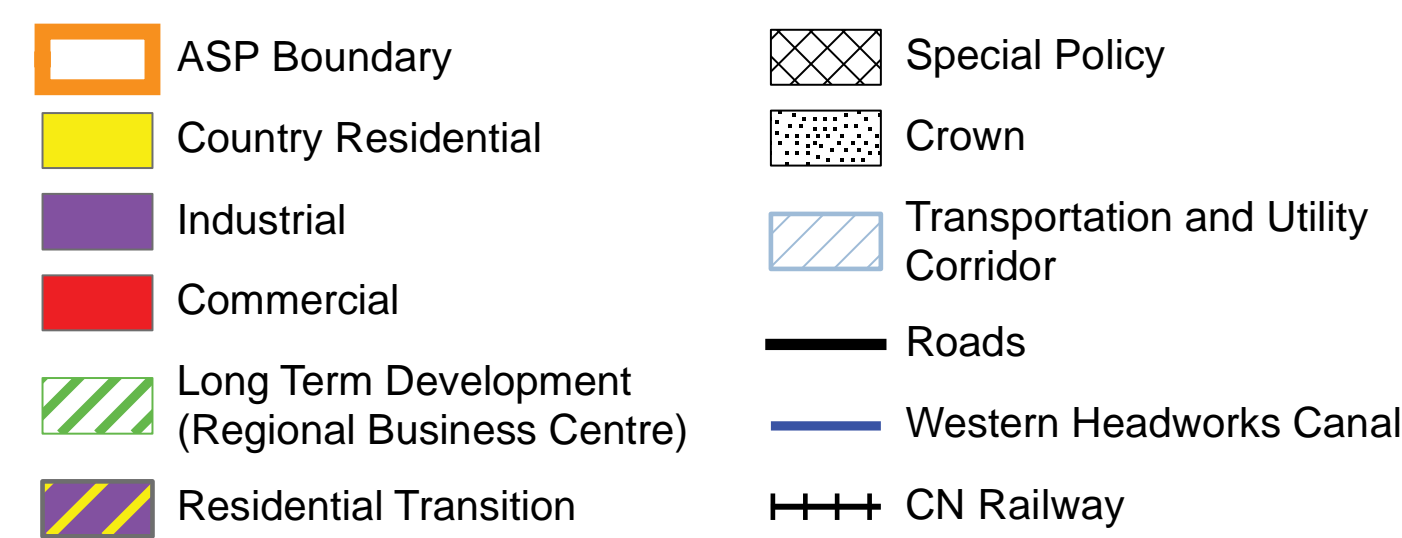
The study area includes land in Calgary, Rocky View County and the Stoney Trail right-of-way owned by Alberta Transportation.

The City of Calgary, Rocky View County and Alberta Transportation formed a Technical Review Committee to undertake this study. The Technical Review Committee has jointly approved the recommendations with the best interests of all in mind.

The study area is largely undeveloped; however, the Shepard Industrial and Janet Area Structure Plans confirm this will be a major business/ industrial area in the future.



2014 Rocky View County approved Janet Arena Structure Plan — Land Use Strategy



2009 City of Calgary approved Shepard Area Structure Plan — Land Use Concept

Pathways indicated within Rocky View boundaries are conceptual and will be determined at Outline Plan stage.

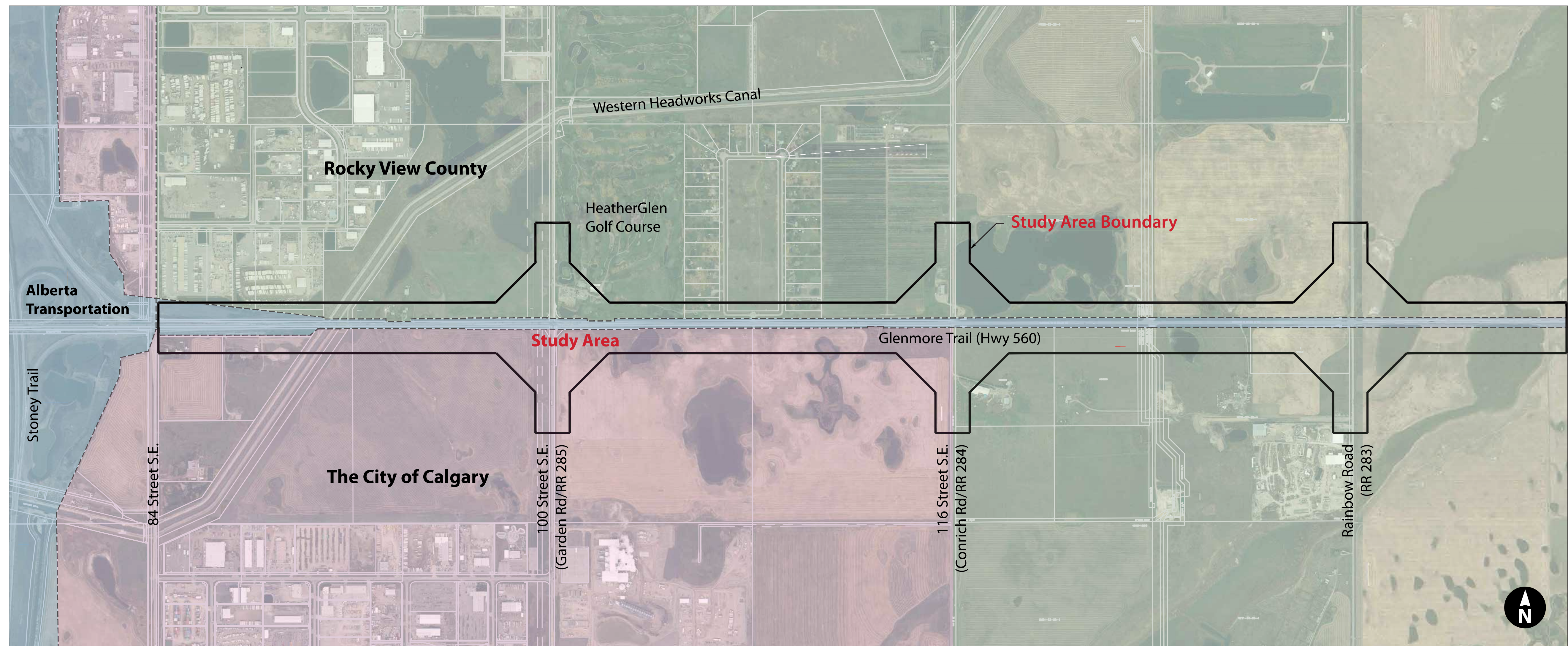


# Study purpose and outcomes

**Purpose** — Identify interchange layouts and land requirements along Glenmore Trail, from Stoney Trail to Rainbow Road\*. The proposed interchanges also considered accommodation of high-load trucks, area access, transit priority and active modes. The study also addresses existing operational and safety deficiencies at 100 Street S.E., and the impact those could have on planned growth for the area.

**Outcomes** — Provide improvements that reduce delays and improve capacity of the roadways in the study area, while improving safety and minimizing impacts to road users, land owners and the environment.

**Timeline** — Most of the long-term recommendations put forward by the study are unfunded and are not anticipated to be built for more than 20 years.



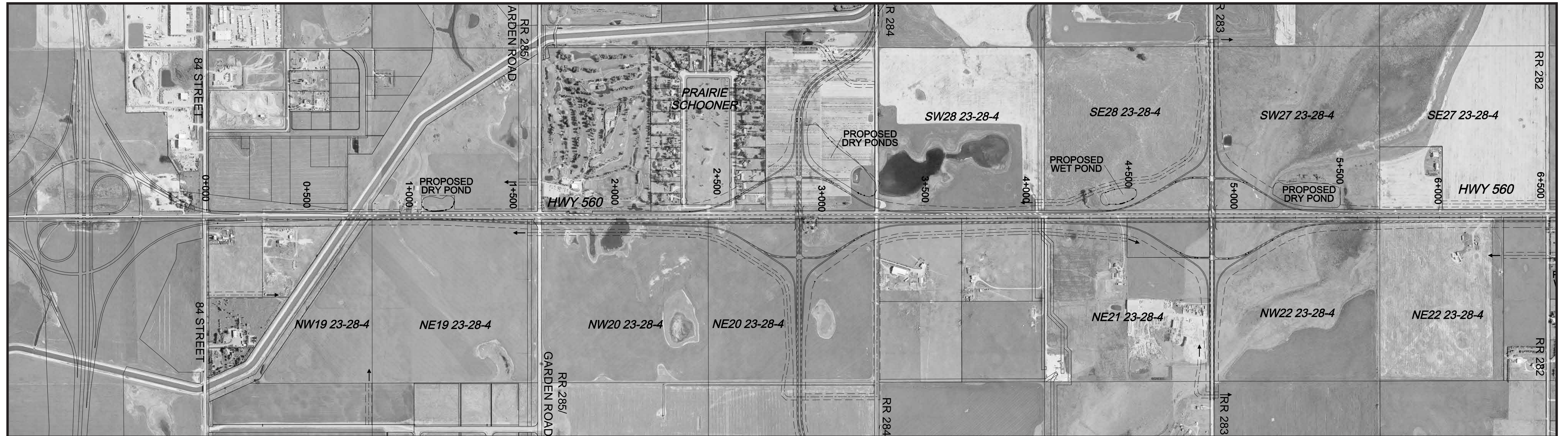
\*The initial scope was confined to the Glenmore Trail and 100 Street S.E. intersection. Based on public input, planned development and the shifting role of 116 Street S.E., the study area was expanded to include the 116 Street S.E. interchange in Phase 2 of the study. While developing the final recommendations, Rainbow Road was also included due to its proximity to the 116 Street S.E. interchange and its role in this transportation network.

Glenmore Trail East Study —  
100 Street S.E. to Rainbow Road

- Legend**
- Rocky View County
  - Alberta Transportation
  - The City of Calgary
  - Jurisdictional Boundary
  - Study Area

# Study background

The Highway 560 Functional Planning Study, completed by Alberta Transportation in 2007, is the existing approved long-term plan for this corridor. Other planning documents, listed below, were also used to understand the existing and future needs of the corridor.



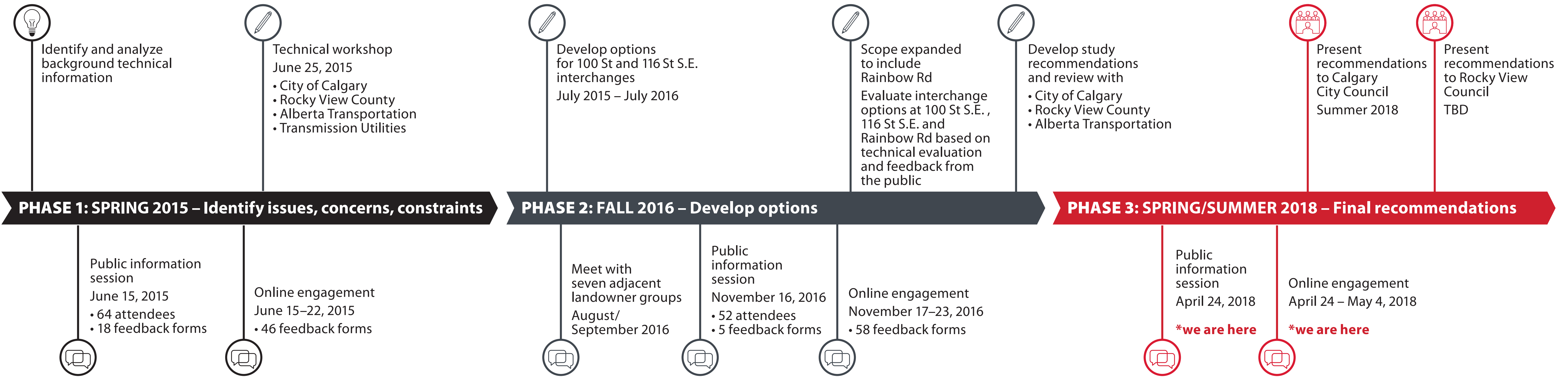
2007 Highway 560 Functional Planning Study — Approved Plan

2007	2009	2013	2014	2015	2016	2018 (Now)
<p><b>Highway 560 Functional Planning Study</b></p> <p>Included upgrading Hwy 560 (Glenmore Trail) to a high-speed, six-lane divided highway, providing local access through grade-separated interchanges, and closing access at 84 Street S.E., Prairie Schooner Estates and 100 Street. S.E.</p>	<p><b>Shepard Industrial Area Structure Plan</b></p> <p>Approved by Calgary City Council, it outlines an expanded business/commercial area and increased industrial land use south of the study area</p>	<p><b>Southeast Stoney Trail Ring Road</b></p> <p>84 Street S.E. access was closed when the southeast leg of Stoney Trail opened, resulting in additional traffic on 100 Street S.E.</p>	<p><b>Janet Area Structure Plan</b></p> <p>Approved by Rocky View County, it outlines increased industrial/commercial land uses and long-term plans for a regional business center north and east of the study area.</p>	<p><b>Glenmore Trail and 100 Street S.E. Functional Planning Study</b></p> <p>The City of Calgary, Rocky View County and Alberta Transportation began exploring recommendations for a half interchange at 100 Street S.E.</p>	<p><b>Glenmore Trail East Study – 100 Street S.E. to 116 Street S.E.</b></p> <p>Scope of initial functional planning study expanded to include 116 Street S.E.</p>	<p><b>Glenmore Trail East Study – Stoney Trail to Rainbow Road S.E.</b></p> <p>Final recommendations of the Glenmore Trail East Study address the corridor from Stoney Trail to Rainbow Road.</p>



# Study process

The study included three phases that combined technical analysis with stakeholder and public engagement through each phase of the project.



## Phase 1: Identify issues, concerns, constraints

- Review approved planning documents for the study area
- Identify site constraints and challenges
- Develop stakeholder and public engagement plan
- Review and assess current and future traffic conditions
- Host stakeholder workshop to identify issues, opportunities and constraints
- Host public information session to introduce study and identify issues and opportunities

## Phase 2: Develop options

- Develop multiple short-term and long-term options for preliminary evaluation
- Develop evaluation framework and criteria
- Host public information session and stakeholder conversations regarding short-term options at 100 Street S.E. and long-term options at 100 Street S.E. and 116 Street S.E.
- Apply Triple Bottom Line framework informed by stakeholder and public feedback and document results
- Recommend a preferred interchange layout based on the evaluation results

## Phase 3: Final recommendations

- Prepare recommended plan, including pedestrian and cycling infrastructure, right-of-way requirements, property impacts, construction costs and staging
- Document study findings in a comprehensive report
- Host public information session and stakeholder conversations to share the recommended plan and evaluate the engagement process



# What we heard and what we did

## PHASE 1

### What we heard

### What we did

Provide full access at 100 Street S.E.

Recommended plan includes full access at 100 Street S.E.

Address traffic congestion at 100 Street S.E.

Interchange configurations accommodate forecasted traffic volumes

Timeline for construction at 100 Street S.E. is too long (20–30 years)

Developed short-term recommendation to address current congestion

## PHASE 2

### What we heard

### What we did

Minimize private property impacts

The recommended diverging diamond interchange footprint is significantly smaller than the 2007 Highway 560 Functional Plan (*rural-style diamond interchange*) and therefore reduces the overall impacts to the surrounding properties and wetlands. The recommended plan also keeps the north-south roadways close to its current alignment.

Keep the current alignment of 116 Street S.E. (current approved Highway 560 plan relocates the alignment to the west)

Recommended plan maintains 116 Street S.E. on its current alignment

Protect wetlands and environmentally sensitive areas

We are following the Alberta Wetlands Policy priority approach: 1– wetland avoidance, 2 – minimize impacts, 3 – wetland replacement. However, some wetlands will be impacted in order to maintain the current 116 Street S.E. alignment.

Road safety and travel time are most important operational consideration

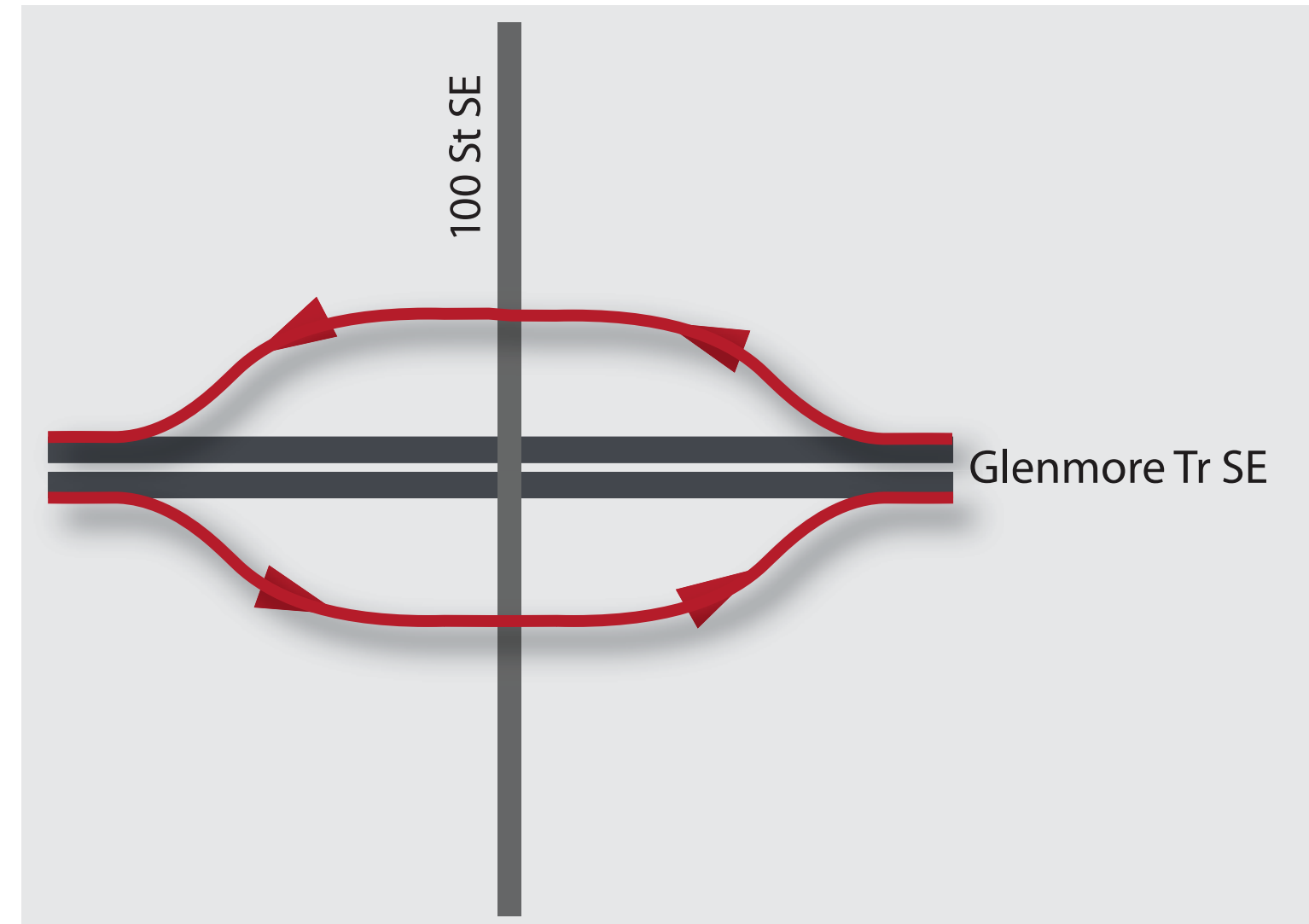
Recommended plans reduce conflict points at the intersection to improve safety, and travel time is reduced by providing free-flow movements for heavy right- and left-turn volumes onto and off the highway.

# Interchange options considered but not moving forward — 100 Street S.E.

**OPTION A:** Do nothing

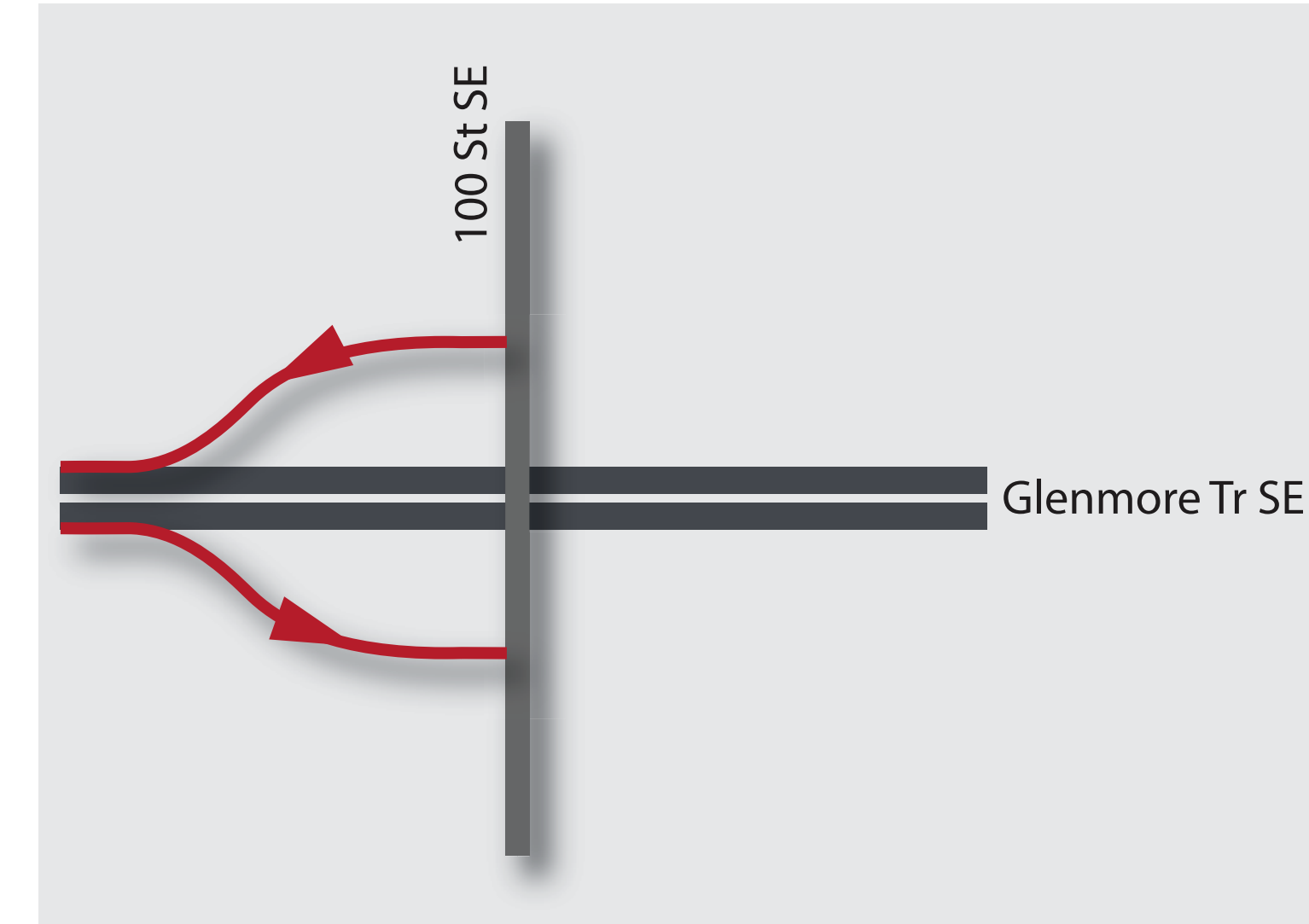


**OPTION B:** Full diamond interchange



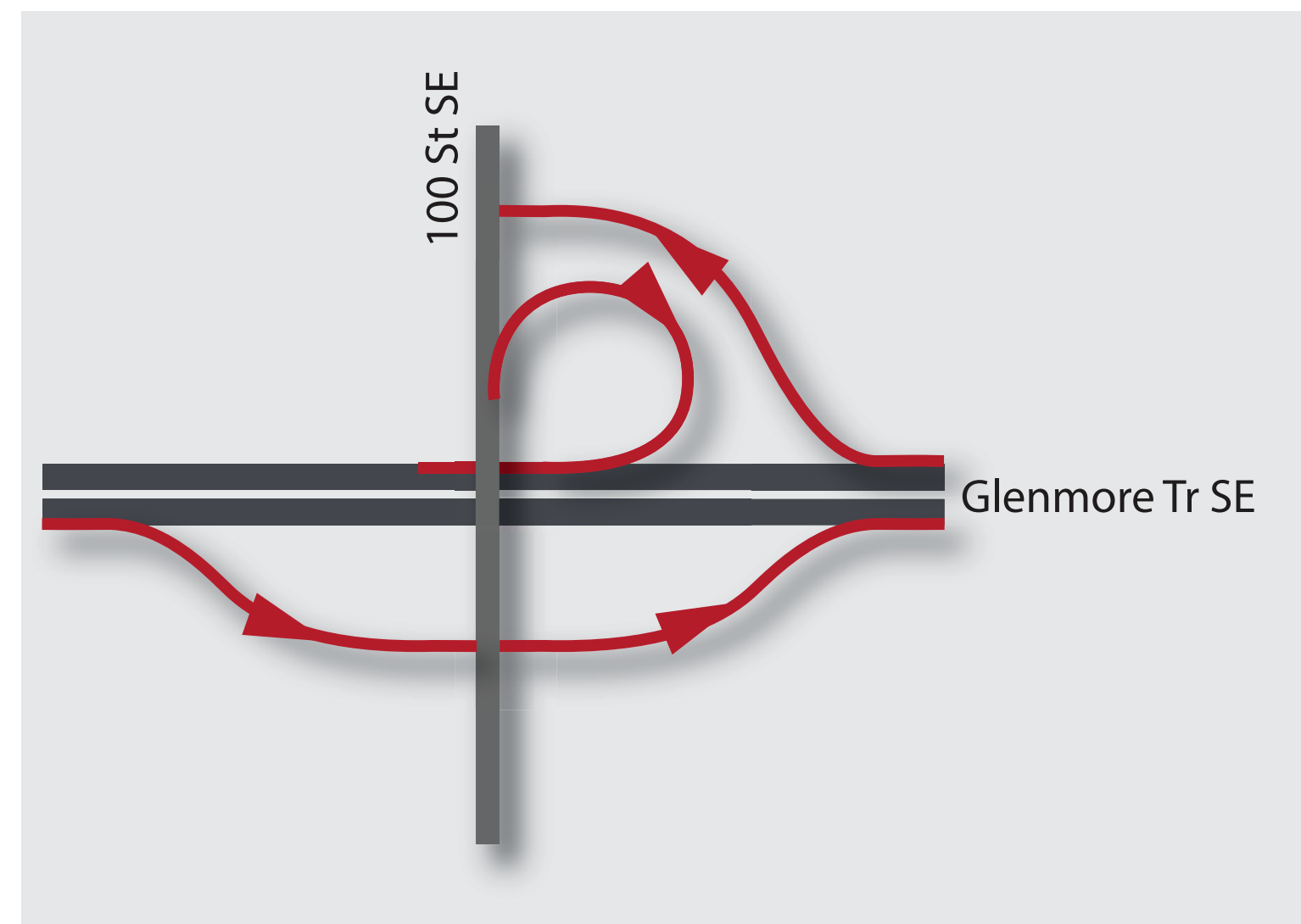
- Full movements at this interchange
- High loads can use the same ramps as the general traffic.
- Minimum desirable weaving distance is provided between adjacent interchanges.

**OPTION C:** Half diamond interchange



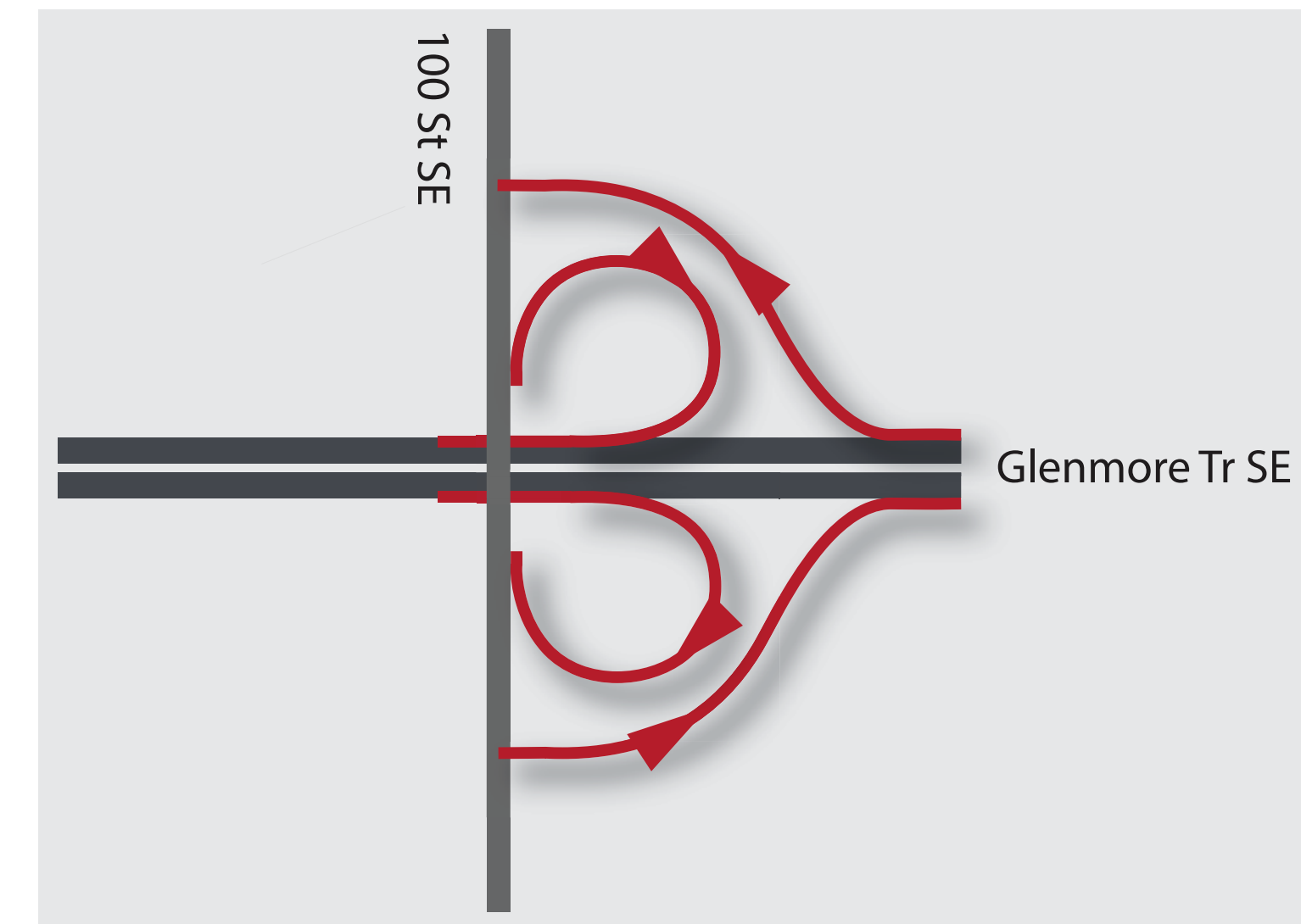
- Access provided to and from City of Calgary side only
- Additional ramps are required on the east side to accommodate high load. These ramps will not be available for use to general traffic.
- Limiting access at 100 St S.E. forces eastbound traffic to other access points

**OPTION D:** Half parclo half diamond interchange



- Full movements at this interchange
- High loads can use the same ramps as the general traffic.
- Minimum desirable weaving distance between adjacent interchanges.

**OPTION E:** Partial Cloverleaf (Parclo AB)



- Considered with and without 100 Street S.E. realignment
- In both cases, there is not enough space to allow for full access at 100 Street S.E.

A number of interchange configurations were considered for the 100 Street S.E. intersection.

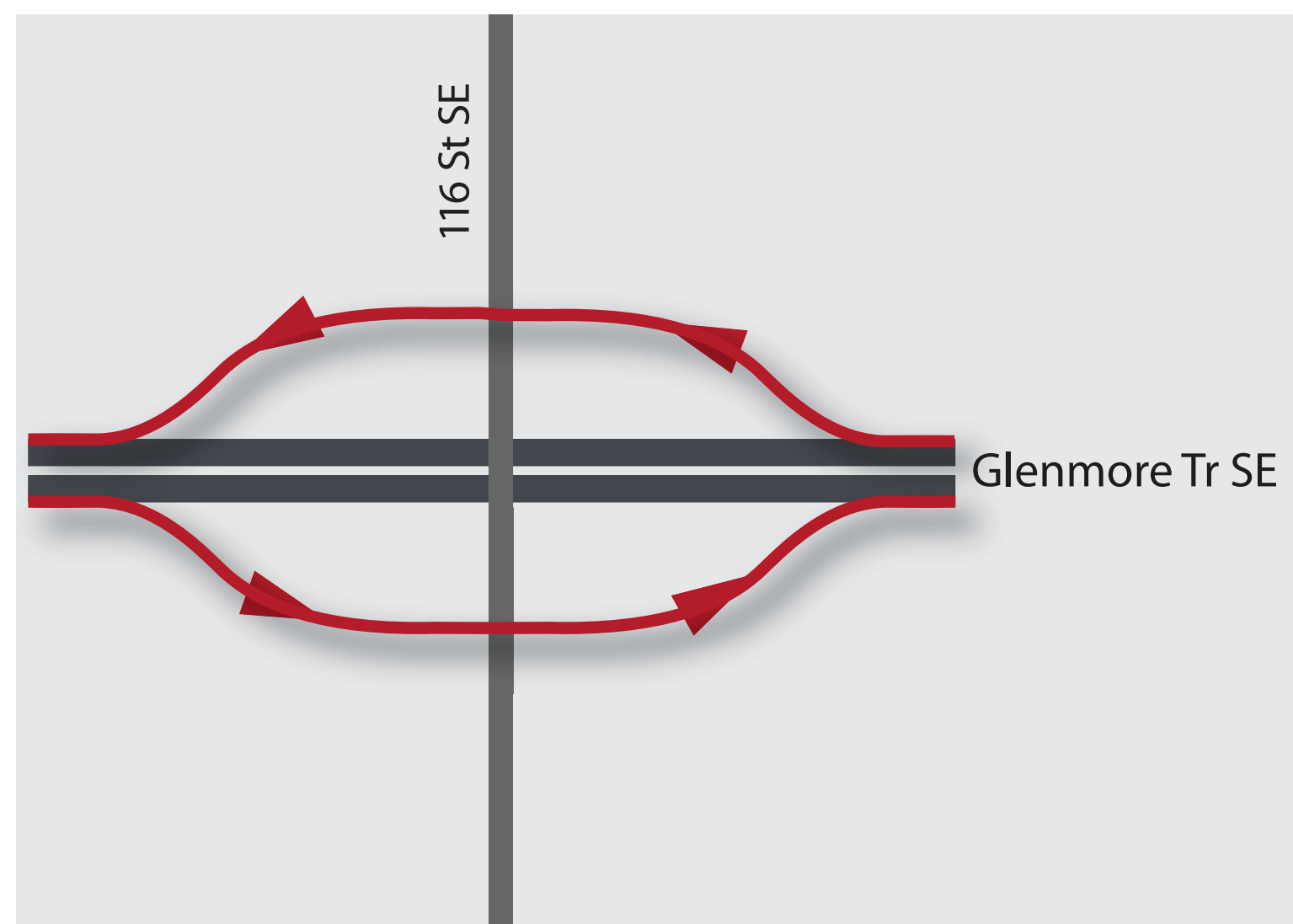
# Interchange options considered but not moving forward — 116 Street S.E.

A number of interchange configurations were considered for the 116 Street S.E. intersection

**OPTION A:** Do nothing

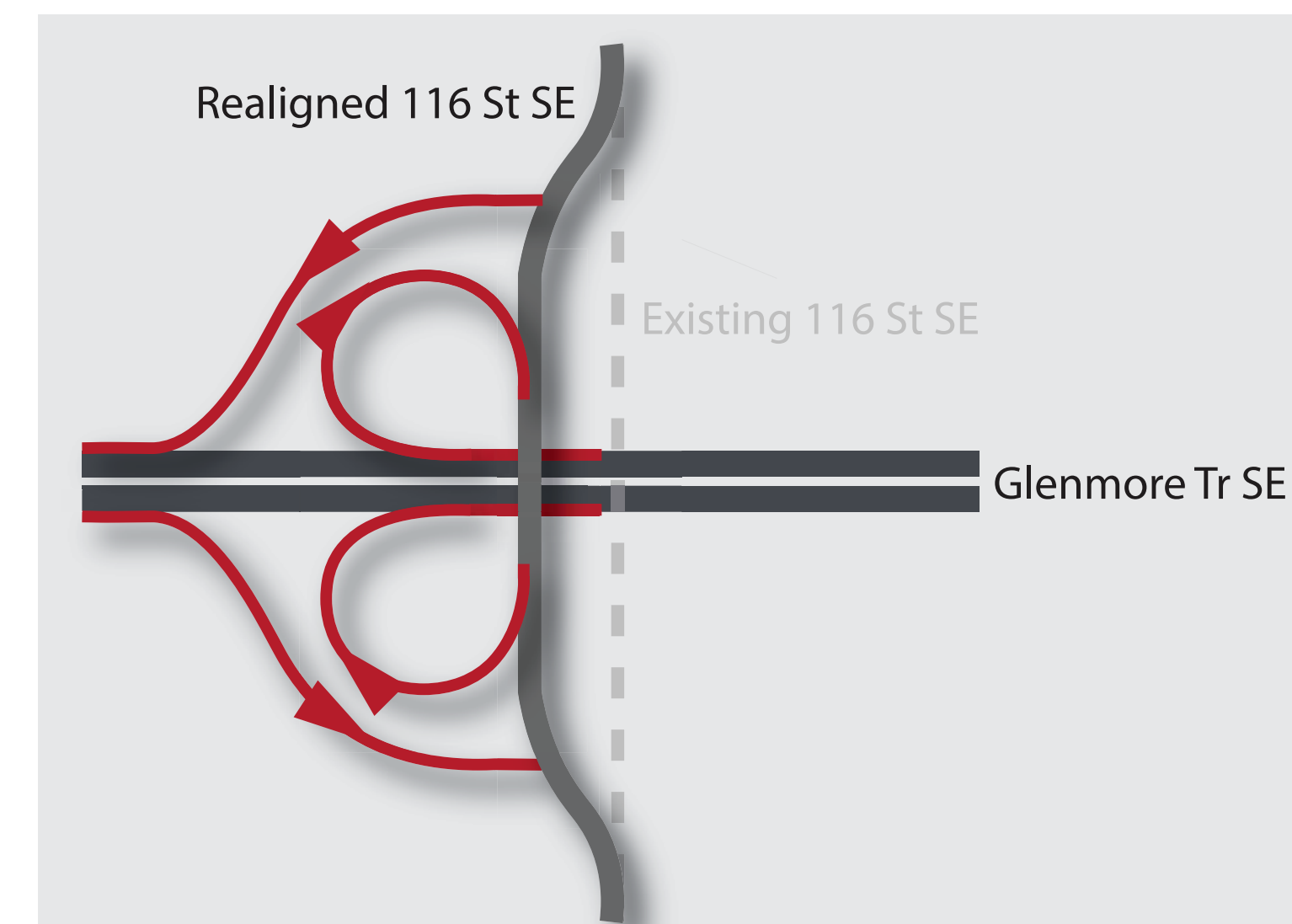


**OPTION B:** Full diamond interchange



- Full movements at this interchange
- High loads can use the same ramps as the general traffic.
- Minimum desirable weaving distance is provided between adjacent interchanges.

**OPTION C:** Partial Cloverleaf (Parclo AB)



- Considered with and without 116 Street S.E. realignment
- In both cases, there is not enough space to allow for full access at 100 Street S.E.





# Evaluation

After technical analysis of the different configurations and combinations, a short-list of options was developed and evaluated using Economic, Social and Environmental criteria.

## Diamond vs. DDI Qualitative Measures Summary

TBL	INDICATORS	DIAMOND	DDI	
<b>Economic</b>	Financial	Operating and maintenance costs / efforts	✓	
		Utility relocation costs	=	=
	Transportation	High load access	✓	
		Heavy vehicle usability		✓
		Accommodates transit	✓	
	Feasibility and deliverability	Accommodates cycling and walking		✓
		Constructability		✓
<b>Social</b>	Community impacts	Staging opportunity	=	=
		Accessibility to network	=	=
		Visual aesthetics	=	=
	Stakeholders	Construction impact to residences and businesses	=	=
		Public acceptability	=	=

## Diamond vs. DDI Quantitative Measures Summary

TBL	INDICATORS	DIAMOND	DDI	
<b>Economic</b>	Financial	Present value of project cost	✓	✓
	Transportation	Travel time savings		✓
		Traffic safety		✓
		Reduction in traffic congestion and improved capacity		✓
<b>Social</b>	Community impacts	Private property impacts	✓	
		Land consumption	✓	
<b>Environmental</b>	Environmental	Impacts on indigenous species, removal of habitat	✓	
	Cultural heritage	Impact on historical sites	✓	
	Pollution	Impact on air quality	=	=

# Recommended interchange configuration

## Benefits of a diverging diamond configuration:

- Improves safety by removing the need for left-turns across opposing traffic
- Reduces the number of conflict points
- Right- and left-turns do not need signals
- Accommodates high left-turn volumes onto and off the highway as well as through-volumes on the cross streets
- Signals only have to accommodate through movements resulting in less wait time at lights

## Challenges with a diverging diamond configuration:

- Can appear confusing due to cross-overs at signals
- Truck left-turns require more space than other interchange types
- More difficult for pedestrians and cyclists to cross free-flow turn movements. In order to maximize safety, crosswalks shall be located with maximum visibility.

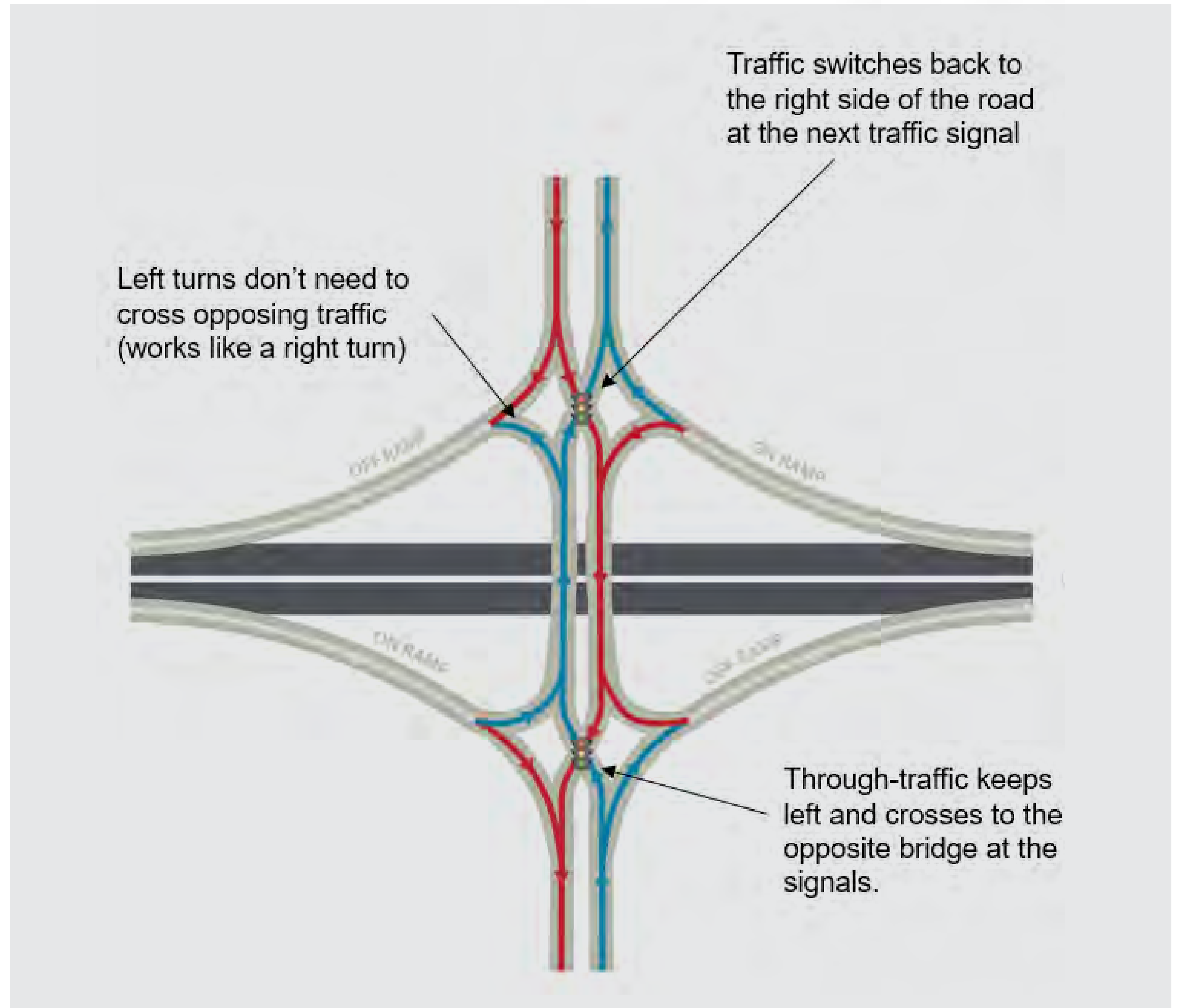
**Diverging Diamond Interchange** — A diverging diamond configuration is recommended at all interchange locations.



Macleod Tr./162 Avenue S.W.  
Source: ISL Engineering



I-285/Ashford Dunwoody Interchange  
Source: America's Transportation Awards

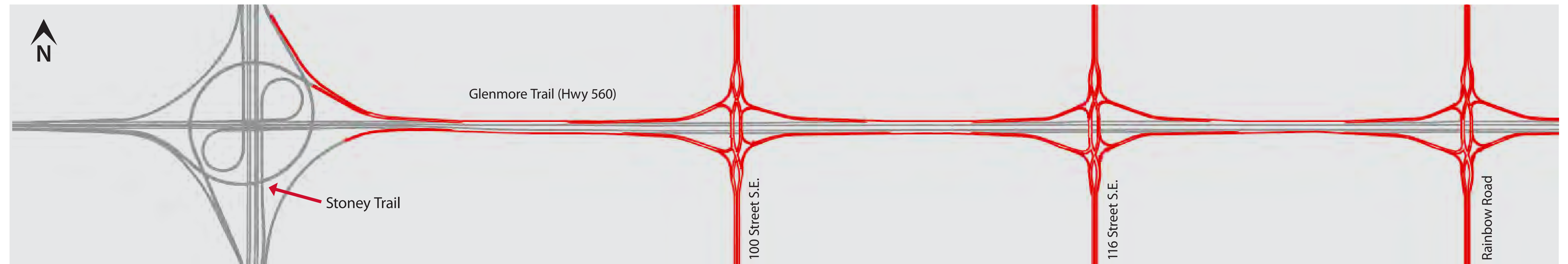


# Summary of recommendations

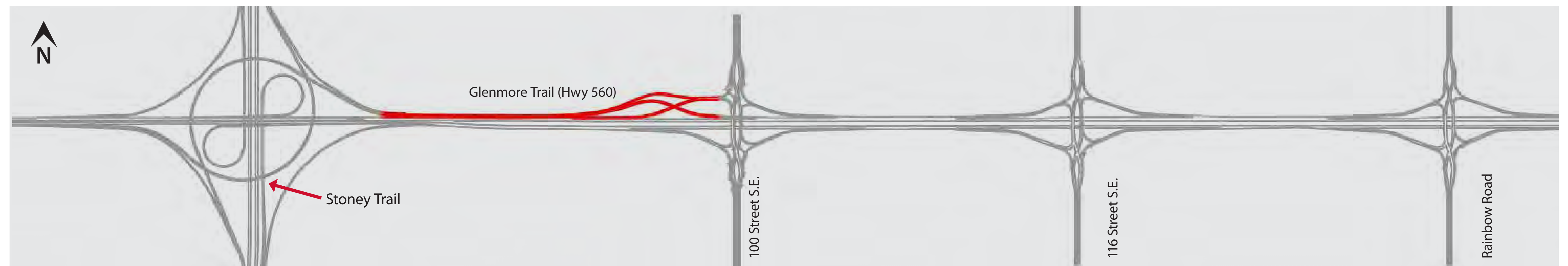
Key components and features of the recommended plan include:

- Diverging diamond interchanges at 100 Street S.E., 116 Street S.E. and Rainbow Road
- Glenmore Trail widened to six through-lanes (three in each direction)
- 100 Street S.E., 116 Street S.E. and Rainbow Road widened to four-lane arterial streets
- Basketweave ramp structure in the westbound direction of Glenmore Trail, between 100 Street S.E. and Stoney Trail to facilitate merging onto Glenmore Trail from 100 Street S.E.
- Pedestrian and cycling facilities provided at each interchange
- Short-term improvements to increase capacity at the intersection of Glenmore Trail and 100 Street S.E.

All the recommendations being put forward through the functional planning study are currently unfunded. Most of the long-term recommendations are not anticipated to be built for more than 20 years.



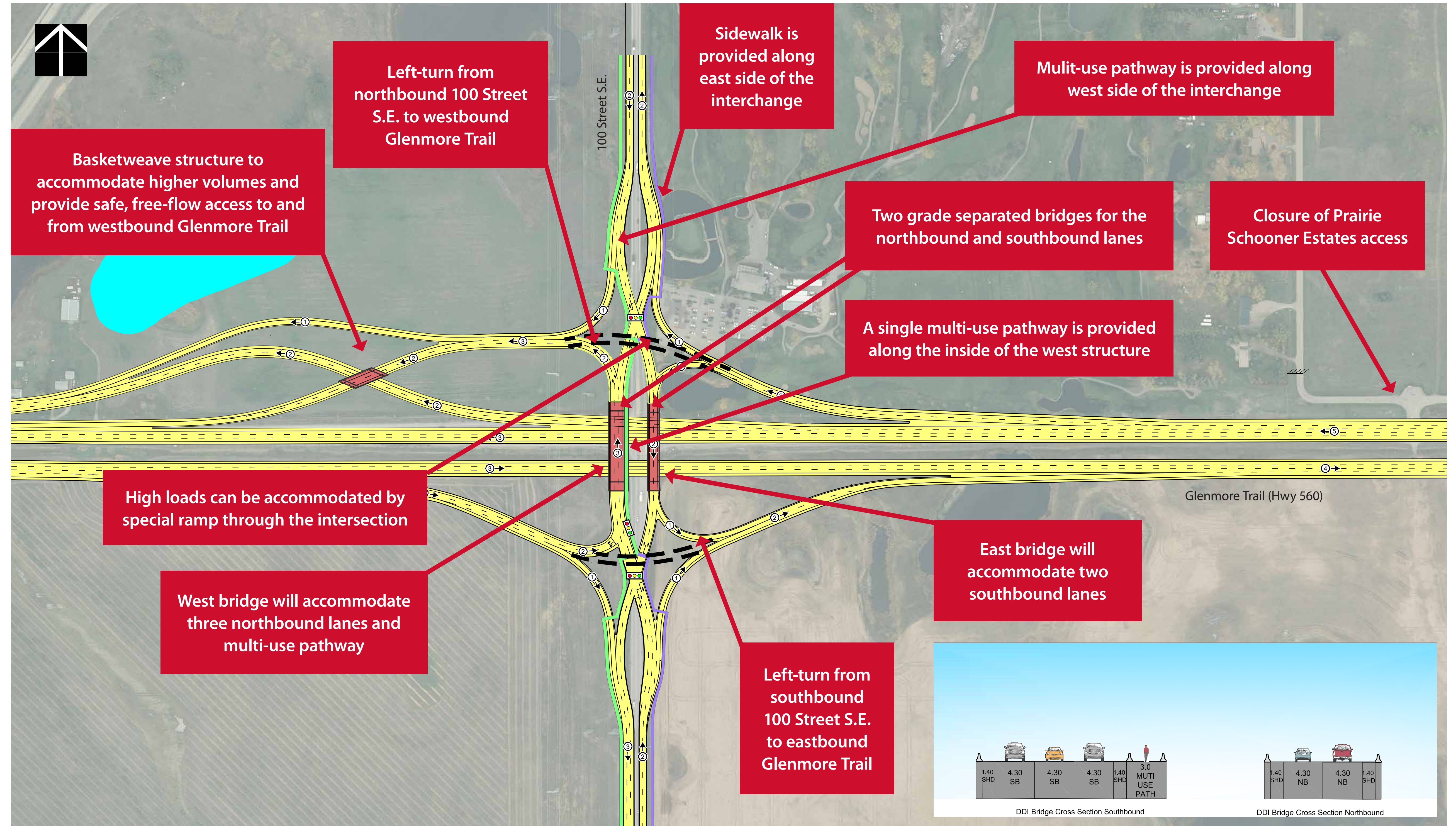
Glenmore Trail East Study — 100 Street S.E. to Stoney Trail



Glenmore Trail East Study — basketweave between Stoney Trail and 100 Street S.E.

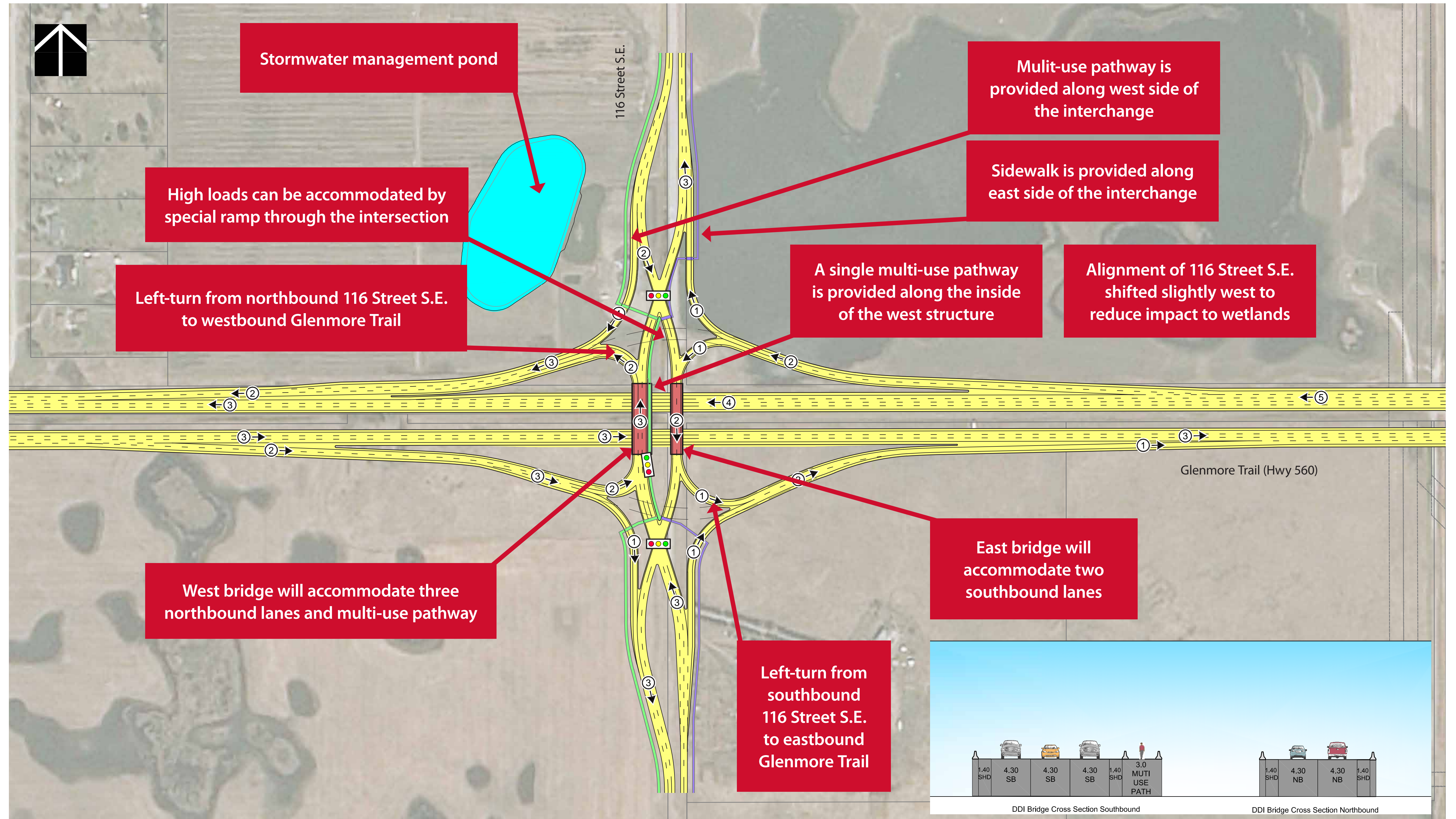
# Recommended interchange design – 100 Street S.E.

## Diverging Diamond Interchange



# Recommended interchange design – 116 Street S.E.

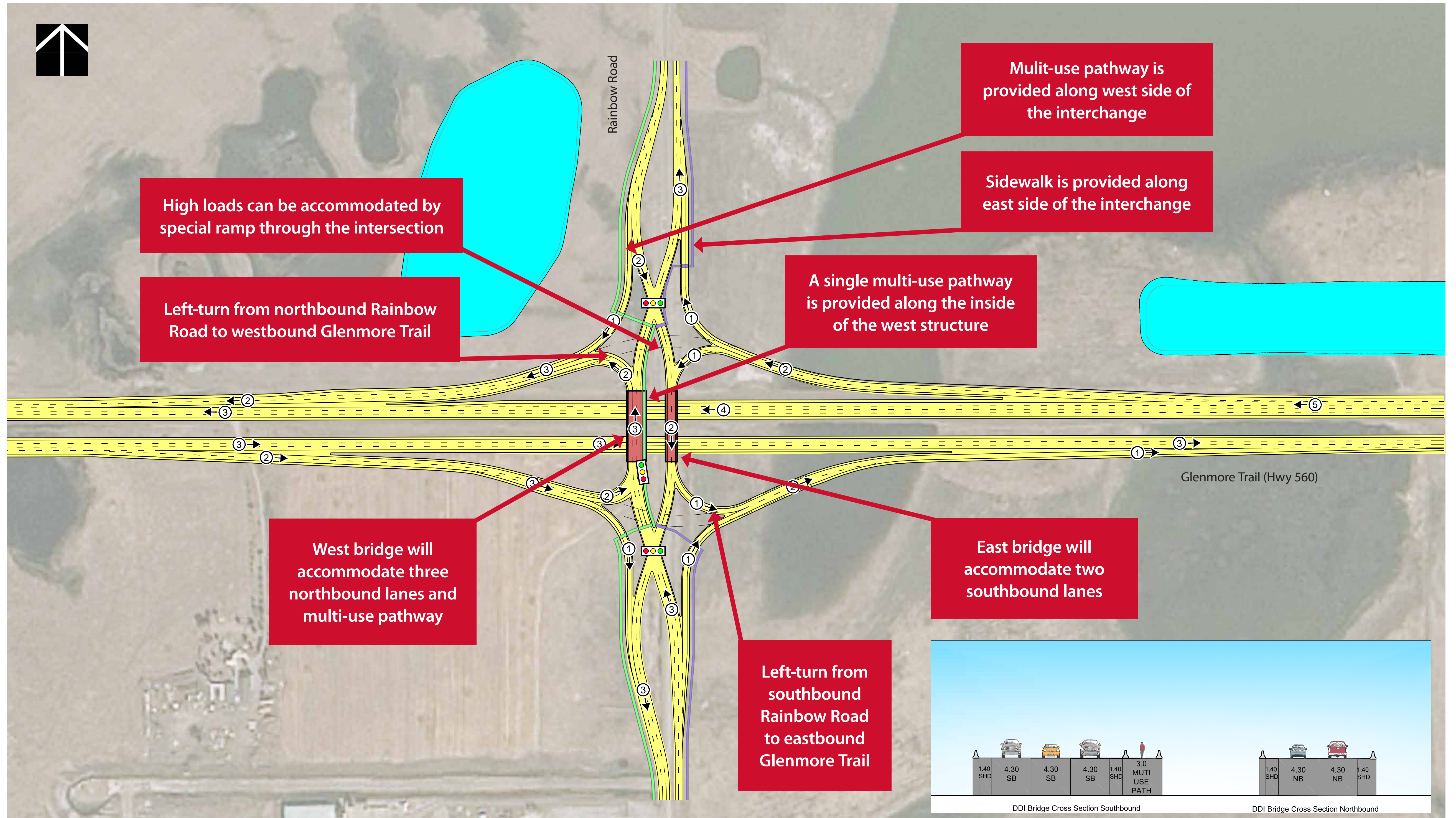
## Diverging Diamond Interchange



- Legend**
- Proposed road
  - Proposed pathway
  - Proposed sidewalk
  - Proposed bridge
  - Proposed storm pond
  - Proposed high load extents
  - Traffic signal
  - Lane Count/Direction

# Recommended interchange design – Rainbow Road

## Diverging Diamond Interchange



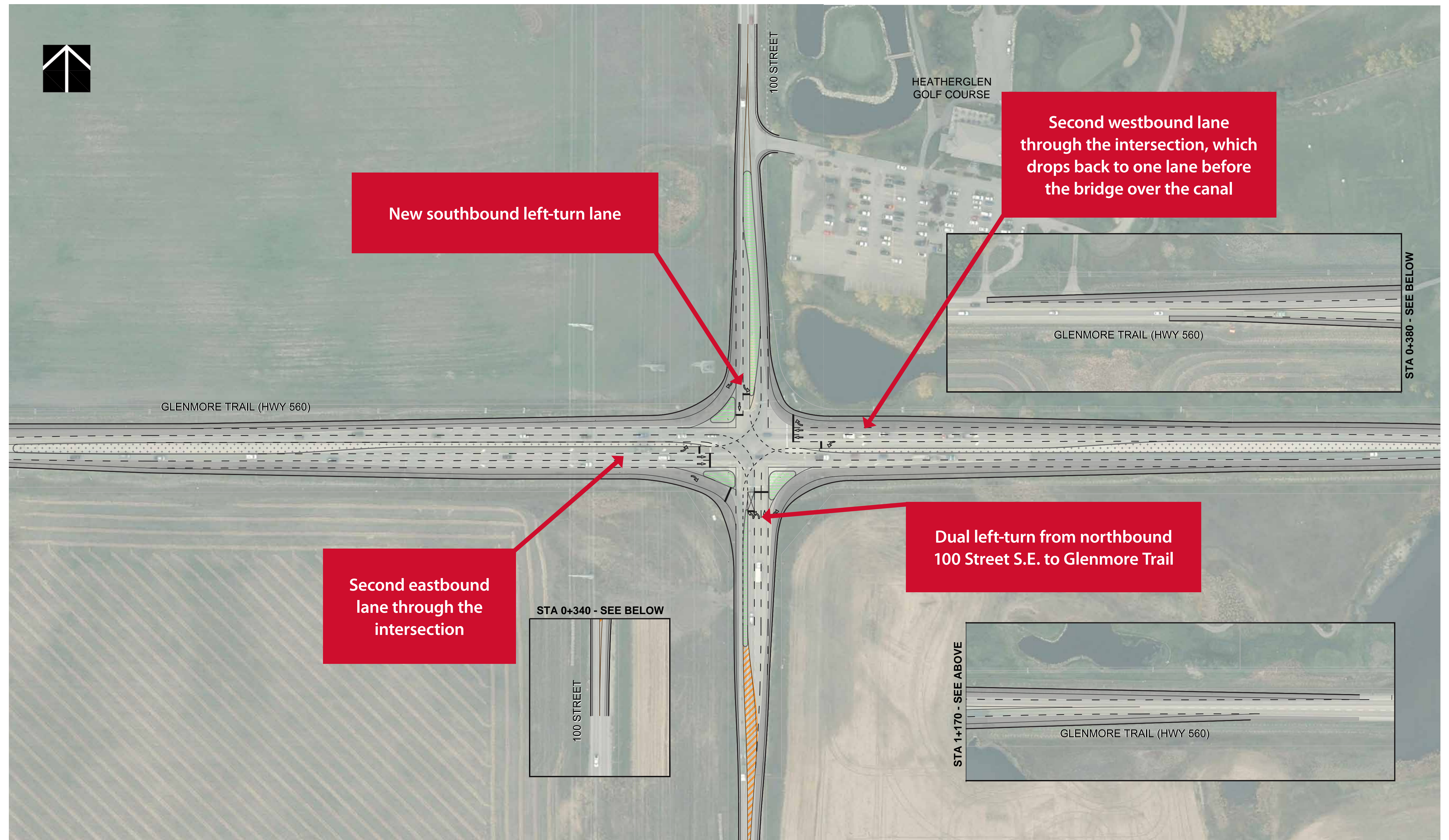
# Recommended short-term improvements – 100 Street S.E.

The recommended design will use existing infrastructure (pavement and medians) while minimizing impacts to utilities and property. The implementation of the short-term recommendations will happen as funding becomes available. Other options may be explored to maximize the life of the improvements (for example: dual left-turn from southbound 100 Street S.E. to eastbound Glenmore Trail).

In response to feedback received from the public, the study explored short-term improvements that could provide immediate benefits to the intersection of Glenmore Trail and 100 Street S.E.

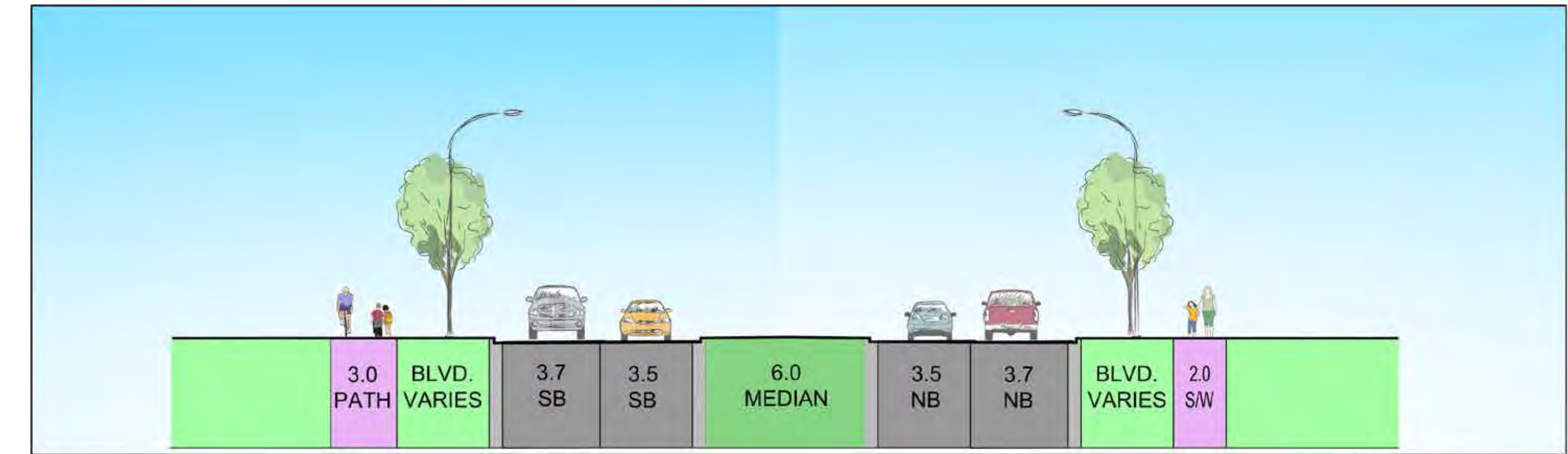
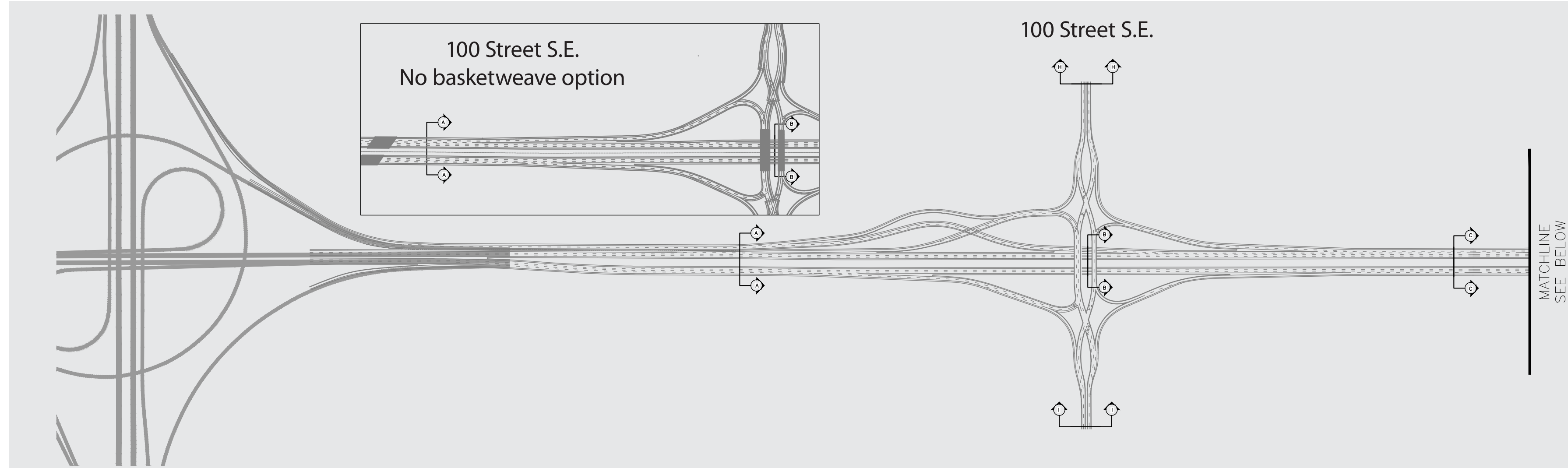
The recommended short-term improvements include:

- Additional eastbound and westbound through-lanes on Glenmore Trail
- Additional northbound to westbound left-turn lane to create a dual left-turn
- New dedicated, protected southbound to eastbound left-turn lane
- New dedicated southbound to westbound right-turn lane
- Longer merge lanes for traffic merging onto Glenmore Trail
- Improved length of off-ramps from Glenmore Trail onto 100 Street S.E.

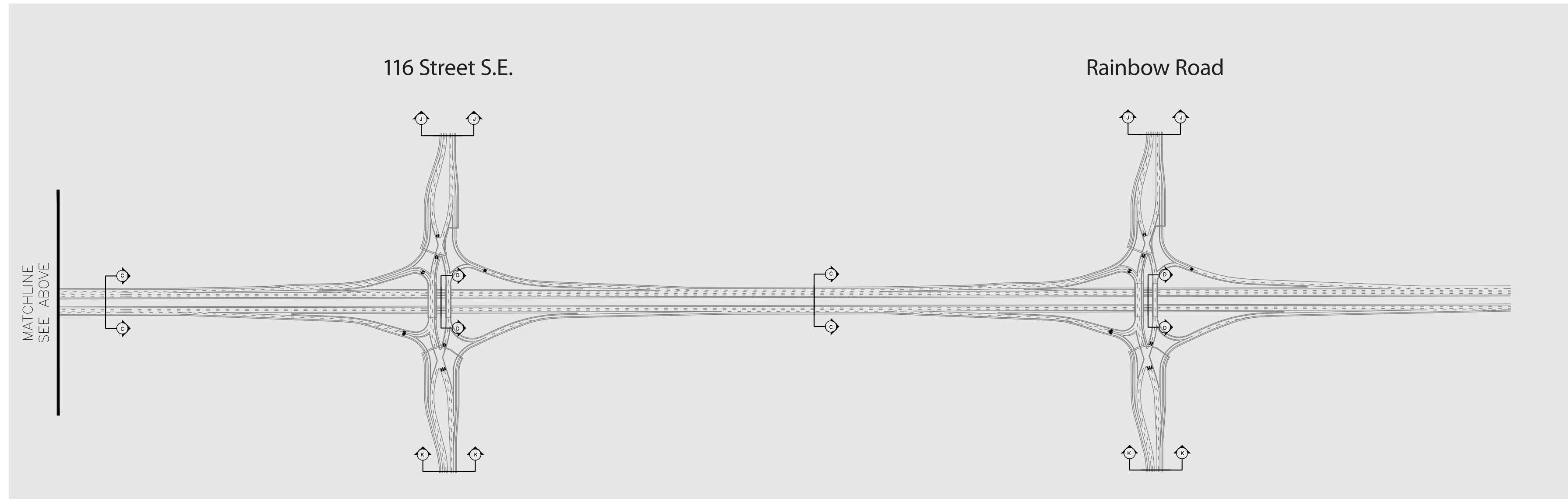


# Cross-sections

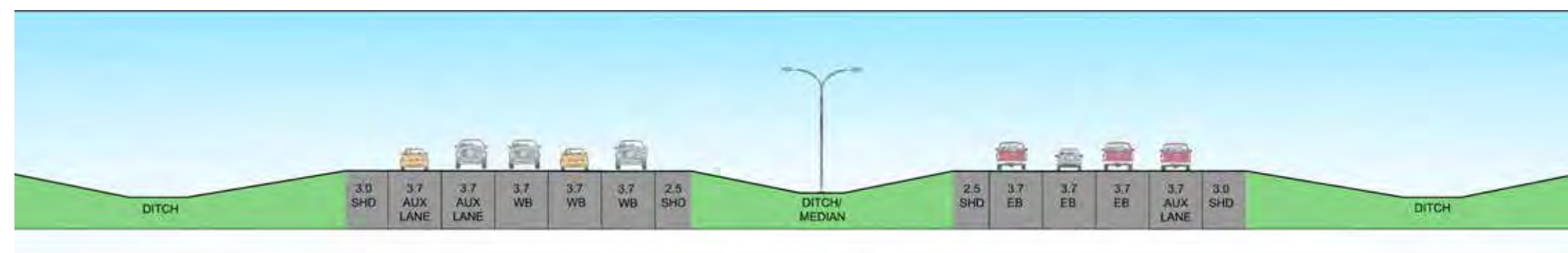
## Location Map



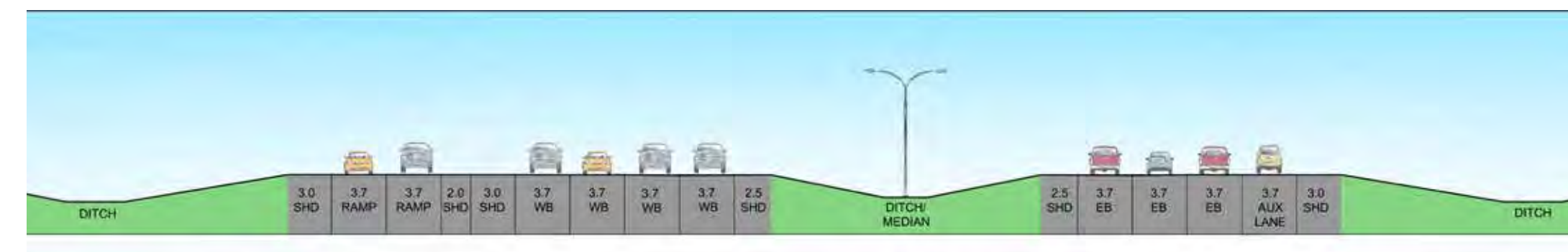
100 Street S.E., 116 Street S.E. and Rainbow Road  
Section H, I and J from Location Map



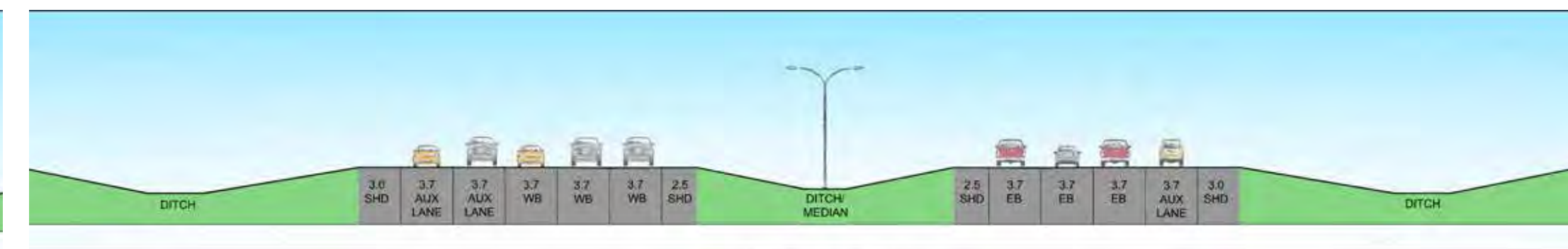
116 Street S.E. and Rainbow Road  
Section K from Location Map



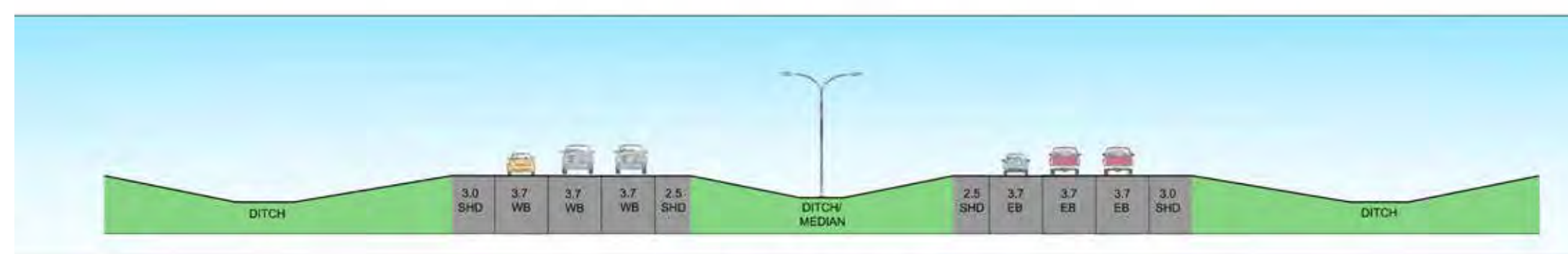
Glenmore Trail Without Basket Weave  
Section A from Location Map



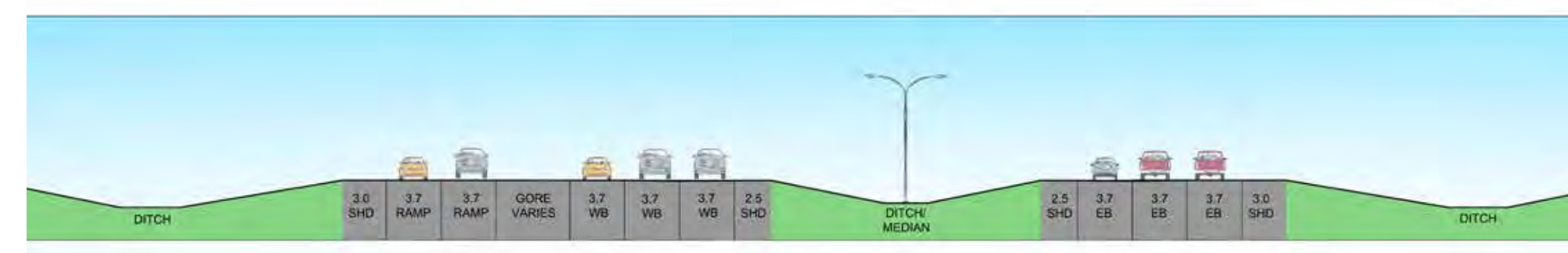
Glenmore Trail With Basket Weave  
Section A from Location Map



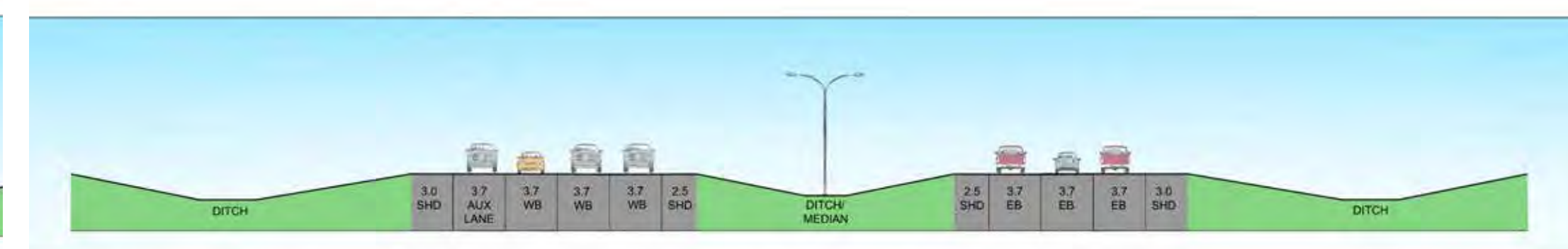
Glenmore Trail Section With Auxiliary Lanes  
Section C from Location Map



Glenmore Trail Without Basket Weave  
Section B from Location Map



Glenmore Trail With Basket Weave  
Section B from Location Map



Glenmore Trail Section With Auxiliary Lane  
Section D from Location Map



# Pedestrian and cycling accommodation

North-south walking and cycling connections are provided at each of the interchanges, using the same design:

- 3.0 metre multi-use pathway is provided along the west side of the interchange
- 2.0 metre sidewalk is provided along the east side of the interchange
- Barriers provide separation between active travel facilities and vehicle lanes

**Benefits:**

- Compared to a design with only one bridge, the number of times a pedestrian or cyclist must cross the roadway is reduced
- No conflict with left-turning vehicles
- Allows crossings in all directions

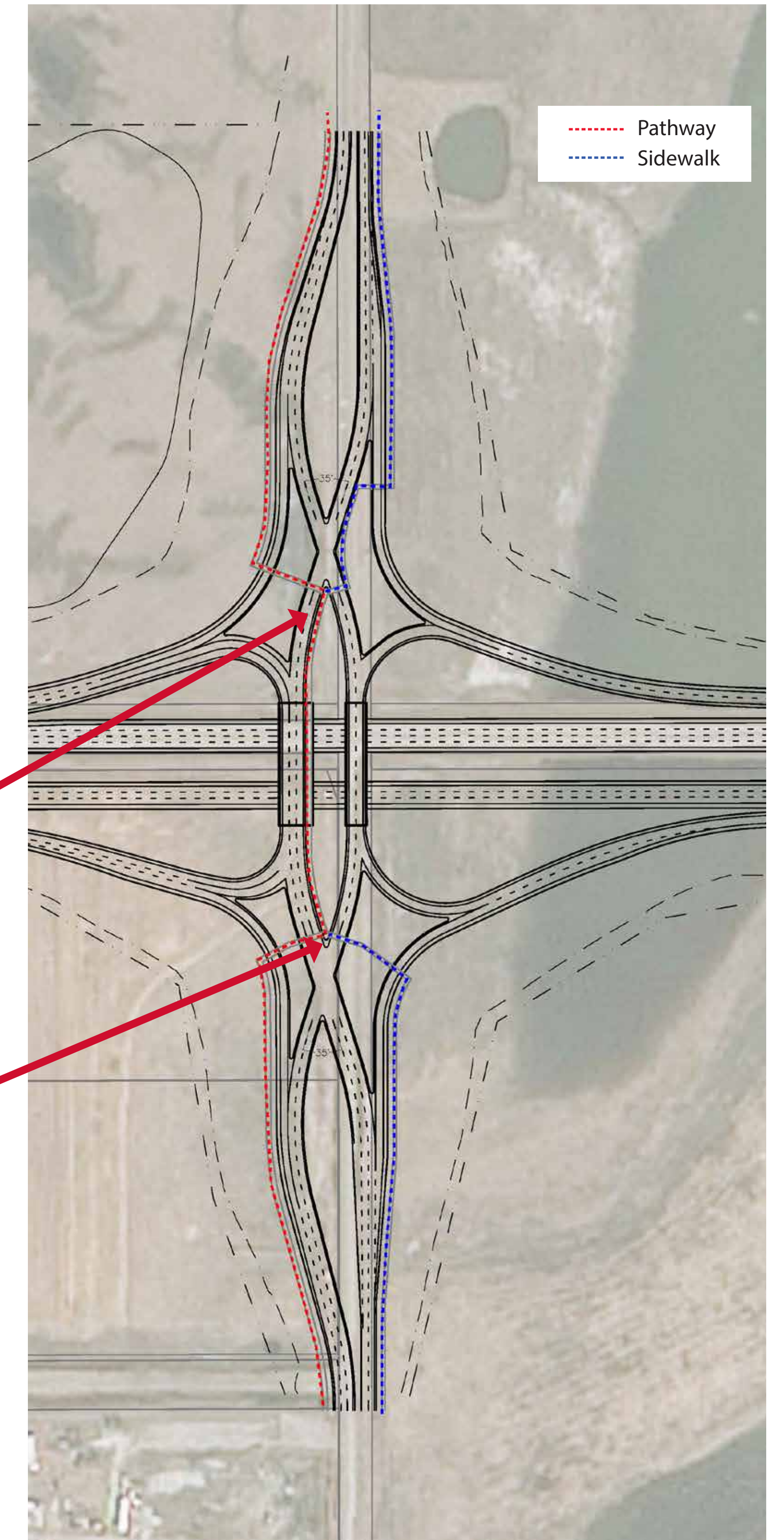
The walking and cycling facilities are required to tie-in to the planned facilities to the north and south of Glenmore Trail.

As the multi-use pathway and sidewalk approach the interchange at Glenmore Trail, pedestrians and cyclists will be directed to the inside of the west structure, onto a single multi-use pathway

Facilities minimize conflict with left-turning vehicles

Crossings to the center of the westbound structure are signal controlled with walk signals

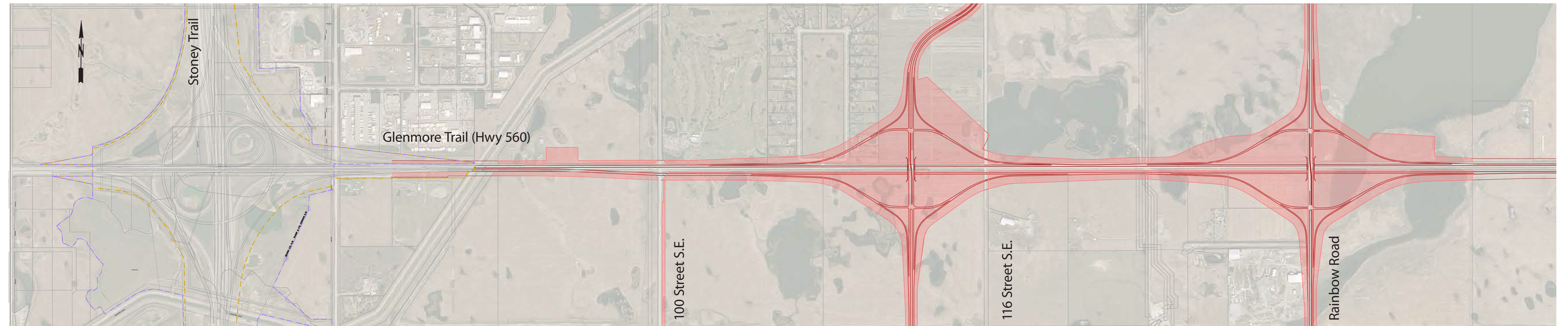
Pathway / sidewalk design at each interchange



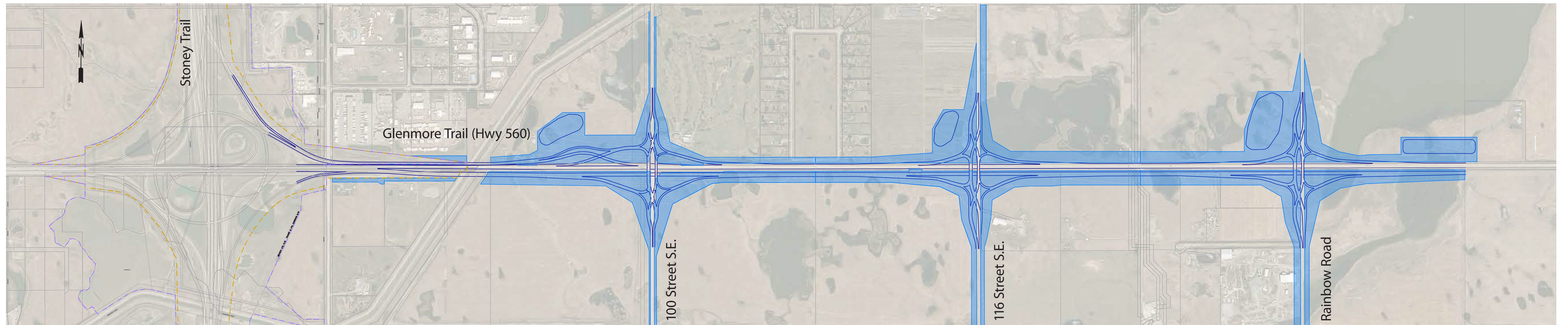
# Recommended plan vs. approved Highway 560 plan

If approved, the Glenmore Trail East Study will replace the current Highway 560 approved plan from Stoney Trail to Rainbow Road. The recommendations in the Glenmore Trail East Study require less land overall, and have less impacts on private properties.

2007 Highway 560  
Functional Planning Study  
Approved Plan



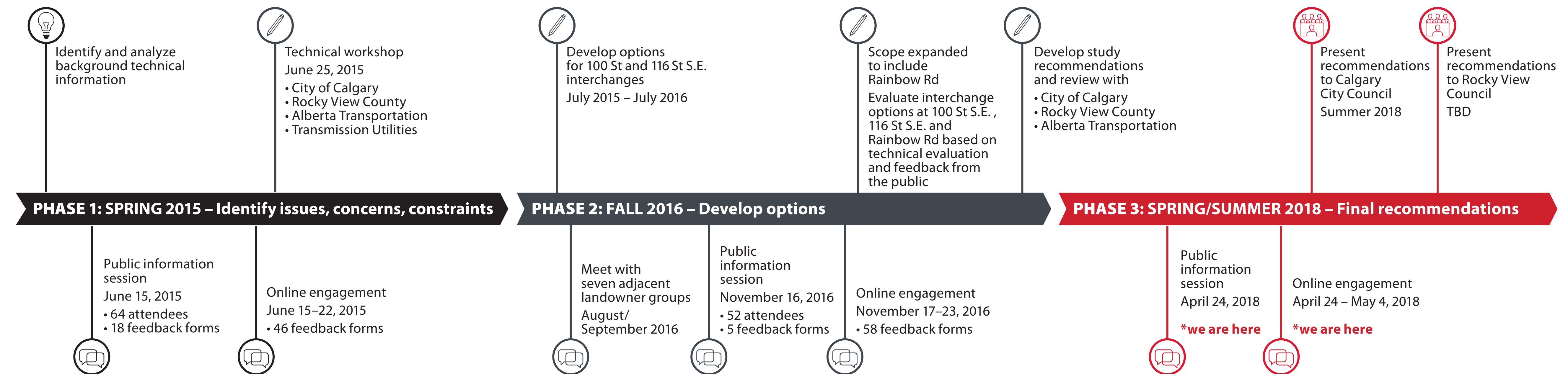
Glenmore Trail East Study  
Recommended Plan





# Thank you for coming!

Please complete a comment form before you leave or visit [calgary.ca/GlenmoreTrailStudy](http://calgary.ca/GlenmoreTrailStudy) to complete it online before May 4.



## Next Steps

- Review and compile public comments and attach to final report
- Present to Calgary City Council in Summer 2018
- Present to Rocky View County Council - TBD